ABUNDANCE AND SPATIAL DISTRIBUTION OF BIRD POPULATIONS AT CIERVA POINT, ANTARCTIC PENINSULA

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SUMMARY

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The bird community in the vicinity of Cierva Point, Antarctic Peninsula (including Site of Special Scientific Interest No. 15), was surveyed from the 1990/91 to 1995/96 breeding seasons. Of 15 bird species found in the area, 13 were breeders (Chinstrap Penguin *Pygoscelis antarctica*, Adélie Penguin *P. adeliae*, Gentoo Penguin *P. papua*, Southern Giant Petrel *Macronectes giganteus*, Pintado or Cape Petrel *Daption capense*, Snow Petrel, *Pagodroma nivea*, Wilson's Storm Petrel, *Oceanites oceanicus*, Imperial Cormorant or Blue-eyed Shag *Phalacrocorax atriceps*, Greater Sheathbill *Chionis alba*, Subantarctic Skua *Catharacta antarctica*, South Polar Skua *C. maccormicki*, Kelp Gull *Larus dominicanus* and Antarctic Tern *Sterna vittata*) whereas two were non-breeding visitors: White-chinned Petrel *Procellaria aequinoctialis* and Black-necked Swan *Cygnus melanocoryphus.* Gentoo Penguins, Wilson's Storm Petrels, and both skua species were the most abundant on the mainland coast. Chinstrap Penguin and Imperial Cormorant colonies on Pingüino Island were the most numerous. Spatial distribution of nest sites was closely associated with environmental features in all surveyed years. A slight increase in the diversity of nesting and non-breeding resident species was observed after 1990. The low human impact on the area, which affects only the surroundings of Primavera Station, was likely to be significant in the establishment of bird colonies.

INTRODUCTION

Cierva Point and adjacent islands on the Danco Coast, Antarctic Peninsula, were declared a Site of Special Scientific Interest (SSSI No. 15) in terms of the Antarctic Treaty in 1985 as an important example of well developed maritime vegetation and for its seabird breeding colonies (Anon. 1997, 1998). The 52-km^2 area supports a high avian diversity (Agraz *et al.* 1994, Quintana *et al.* 1995). The only previous observations were conducted between 1954 and 1958 (Novatti 1978).

The aim of the present study was to assess the richness, abundance and density of bird species in the Cierva Point area from 1991 to 1996, and to report the occupation patterns of the different habitat-types and their constancy between surveyed years. This assessment was considered necessary prior to protection and conservation actions for this diverse Antarctic seabird community, and so, provide the management plan of the SSSI (Anon. 1998) with useful information.

STUDY AREA

Cierva Point is located on the Danco Coast, on the west side of the Antarctic Peninsula, at 64°09'S, 60°57'W (Fig.1). Vegetation is well developed in the area (*c*. 3 km^2), with a continuous cover of lichens, mosses and grasses (Agraz *et al*. 1994, Anon. 1998). Wildlife is abundant and many species of seabirds nest in it (Quintana *et al.* 1995). General geomorphological features (G.E.S.E.R. 1989) and the special climatic conditions provide ample microhabitats and shelters for birds.

Weather at Cierva Point is moderate, considering the latitude and compared to more northerly locations on the Antarctic continent. Monthly mean temperature ranged between 1.8 and 2.2°C (range –1 to 6.3°C). Relative humidity averaged 79%; it was cloudy and rainy almost every day, and snowy days were frequent. Mean wind speed was 7.9 km h^{-1} (range 0.0 to 40.6 km h^{-1}).

The designation of the area as an SSSI implies infrequent human activity (some sampling and trampling), limited to summer (late November to mid-March). Tourist visits are not permitted in terms of the management plan (Anon. 1998).

METHODS

The survey was conducted from the 1990/91 to 1995/96 summer breeding seasons. The study area was stratified with the zonation proposed by Agraz *et al*. (1994), which identified 10 main different habitat-types. Species richness was estimated on the ice-free sectors of the continental area and on Pingüino and Leopardo Islands (Fig.1). Censuses of several breeding species were carried out in a representative area of the continental area, which included all 10 habitat-types. Other breeding areas were observed in the rest of the Point, but not thoroughly researched because they were difficult to access.

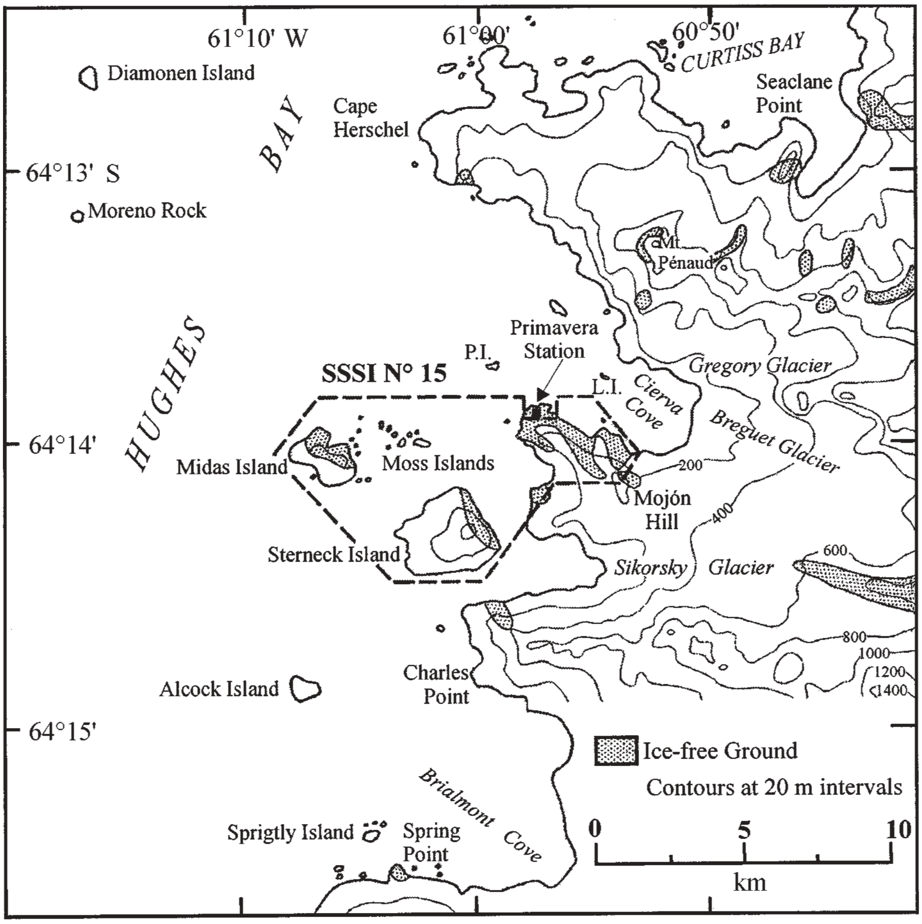

Fig. 1. Location of the SSSI (Site of Special Scientific Interest) N° 15, Cierva Point, Antarctic Peninsula. (– – –) Boundary of SSSI; (■) Primavera Station; P.I.= Pingüino Island; L.I.= Leopardo Island.

Breeding pairs of each species were counted during incubation, except for Chinstrap Penguin *Pygoscelis antarctica* and Imperial Cormorant or Blue-eyed Shag *Phalacrocorax atriceps*, counted after hatching. Adélie *P. adeliae* and Gentoo *P. papua* Penguins were counted in December in all breeding seasons, whereas the rest of the breeders were counted between mid-December and mid-January. Non-breeding visitors were detected during frequent day trips at different times. Counting and observations were made directly or with 7 × 50 binoculars. For some species, censuses were undertaken according to habitat types. For skuas *Catharacta* spp. and Kelp Gull *Larus dominicanus*, particular emphasis was put on counting in habitat-types 4 (moss turf), 9 (coastal cliffs and terraces) and 10 (pebble beach). Only active nests were sampled, ignoring non-breeding adults or juveniles. Pairs of each skua species or mixed pairs were identified as far as possible. A passive infrared system (Orgeira 1997) was used to locate Wilson's Storm Petrel *Oceanites oceanicus* nests in an area of 18 804 m^2 (11 872 m^2 on rocky walls and 6932 m^2 on exposed hillsides). Density and average annual growth rate were computed for Gentoo Penguin, Kelp Gull, and skua colonies. The average annual growth rate (Yáñez *et al.* 1984) was worked out by the following formula:

$$i = \left[\left(BP_{pr} / BP_{ps} \right)^{1/n} \right] x100$$

BP_{pr} stands for the number of breeding pairs at present, BP_{ps} the number of breeding pairs in previous researches and n stands for the years that passed by. This was calculated using the population numbers in this study and in Novatti (1978).

RESULTS AND DISCUSSION

Fifteen bird species were found in the area, out of which 13 were breeders (Chinstrap Penguin, Adélie Penguin, Gentoo Penguin, Southern Giant Petrel *Macronectes giganteus*, Pintado or Cape Petrel *Daption capense*, Snow Petrel *Pagodroma nivea*, Wilson's Storm Petrel, Imperial Cormorant, Greater Sheathbill *Chionis alba*, Subantarctic Skua *C. antarctica*, South Polar Skua *C. maccormicki*, Kelp Gull and Antarctic Tern *Sterna vittata*) whereas two were non-breeding visitors: White-chinned Petrel *Procellaria aequinoctialis* and Black-necked Swan *Cygnus melanocoryphus*. The most abundant in the continental area were Gentoo Penguin, Wilson's Storm Petrel and skuas, whereas Chinstrap Penguin was the most abundant species on both surveyed islands (Table 1).

Southern Giant Petrel, Greater Sheathbill, Pintado Petrel, and Snow Petrel were less numerous or have been recorded breeding only occasionally (Tables 1 and 2).

According to data obtained before the construction of the Cobbet Refuge from 1954 to 1958 (now Primavera Station) the number and abundance of breeding species were higher than in the first breeding seasons of this study. Novatti (1978) reported that the bird populations breeding in the area were affected by severe environmental impact from the building operations. However, in the last years, new bird species arriving and a slight increase in settled species could eventually lead to a situation opposed to that observed by Novatti (1978).

The disposition of the nest sites was closely related with the habitat-type (plant species and geomorphological features), and remained the same throughout the different breeding seasons. Most birds (Pintado Petrel, Snow Petrel, Wilson's Storm Petrel, Greater Sheathbill, Kelp Gull and Antarctic Tern) breed on the coast. Only penguins and skuas and some Wilson's Storm Petrel breed inland. This pattern was observed both on the continental area of Cierva Point and on Pingüino and Leopardo Islands.

In addition to the Chinstrap Penguin colony, a few coastal nests of skuas, Kelp Gulls, Antarctic Terns, Greater Sheathbills and Wilson's Storm Petrels were also found on the northern part of Pingüino and Leopardo Islands. Imperial Cormorants bred only on Pingüino Island.

Gentoo Penguin

The average number of breeding pairs of Gentoo Penguin between 1991 and 1996 was 963, ranging from 800 to 1041. This colony could be considered small compared to those elsewhere in the Maritime Antarctica, especially colonies in lower latitudes (Croxall & Kirkwood 1979, Poncet & Poncet 1985, Favero *et al*. 1991, Williams & Rothery 1990, Woehler 1993, Aguirre 1995). This fact may bear relationship to the more rigorous climate at Cierva Point (Bost & Jouventin 1990).

This species showed a 6.1% increase in the average annual growth rate between 1991 and 1995. However, this rate began to decrease (–1.07%) in the 1994/95 summer, but it increased again in the last two breeding seasons. The same trend was observed when the results of the current study were compared with Novatti's (1978) data (Table 3).

TABLE 1

Number of breeding pairs at Cierva Point. From 1954 to 1958: Novatti's data; ht = habitat-type; (–) no data available; (*) only breeding on Leopardo and Pinguino Is.; (**) censuses carried out at the end of breeding season: Chinstrap Penguin (2055 adults and 1990 chicks) and Imperial Cormorant (19 adults and 33 chicks); (+) using tape-recorded system; (++) using infrared system; (⊕) 93 South Polar Skua, 26 Subantarctic Skua, eigth mixed pairs, 55 not classified

Species		**1954**	**1956**	**1957**	**1958**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Chinstrap Penguin		–	–	–	–	–	–	–	100*	–	**
Adélie Penguin		–	–	–	–	0	0	0	1	1	0
Gentoo Penguin		614	599	582	559	800	890	1009	1025	1014	1041
Southern Giant Petrel		–	–	–	–	0	0	0	0	0	1
Pintado Petrel		14	–	–	–	1	1	1	1	4	7
Snow Petrel		–	–	2	–	0	0	0	0	0	1
Wilson's Storm Petrel		–	–	–	–	–	–	–	–	515^{+}	1168^{++}
Imperial Cormorant		–	–	–	–	–	100	33	–	–	**
Greater Sheathbill		1	4	4	4	3	3	3	3	3	4
Subantarctic and South Polar Skuas	Total	18	–	92	–	–	–	176	–	182$^{\oplus}$	–
	HT4	–	–	–	–	–	–	25	33	24	35
Kelp Gull	Total	85	–	82	–	–	–	69	–	62	–
	HT9	–	–	–	–	–	–	17	19	10	–
	HT10	10–15	–	–	–	–	–	6	10	8	–
Antarctic Tern		65–70	–	85	–	0	0	0	4	4	24

TABLE 2

Species and number of non-breeding visitors observed in consecutive breeding seasons at Cierva Point. 1957: Novatti (1978)

Species	**1957**	**1990/91**	**1991/92**	**1992/93**	**1993/94**	**1994/95**	**1995/96**
Adélie Penguin	–	5	3	2	4	0	3
Southern Giant Petrel	12 to 15	0	0	0	0	5	5
White-chinned Petrel	–	–	–	–	–	–	2
Pintado Petrel	–	0	0	0	27	33	56
Snow Petrel	19	1	2	0	1	26	15
Black-necked Swan	–	–	–	–	–	–	1
Antarctic Tern	–	1	3	4	0	16	29

Gentoo Penguins bred in colonies, organised into subcolonies that kept their place during the sampling years. However, the occupation dynamics included abandonment and colonization of some areas and expansion or reduction of others. The nesting patches of the colony are located between 50 and 190 m above sea level (m a.s.l.); distance to the sea from the nest sites ranged from 239 to 822 m.

Gentoo Penguins nested both in snow-free terraces and vegetation-free areas; the nest density for the whole colony was 1 nest/4 m^2, (range 1 nest/0.65 m^2 to 1 nest/54 m^2). In Gentoo Penguin subcolonies no density differences related to the distance to the coast or altitude were observed. Nest distance did not exceed 1 m, coinciding with other authors' observations in other Antarctic areas (Müller-Schwarze & Müller-Schwarze 1975).

The density of Gentoo Penguins in the different breeding patches seems to be determined by the location of nest sites, so that breeding pairs in suboptimum sites (isolated or on the colonies boundaries) have failed to rear their chicks in all cases (R.D. Quintana & V. Cirelli unpubl. data).

Chinstrap Penguin

Colonies were found in the inland areas of both islands. The Pingüino Island colony had 1984 chicks and 1997 adults by 1 February 1996. By the same date, we could only see six chicks and a group of 58 adults surrounding the nest sites on Leopardo Island, where only 100 pairs were observed in the 1993/94 breeding season. Novatti (1978) mentioned that, in 1954, there was a small but very crowded colony of Chinstrap Penguins on this island, with an average nest density of 1 nest/2 m^2.

These penguins nested on the highest areas of both islands, and the access was by a much craggier slope than to the Gentoo Penguin breeding sites.

The lack of common breeding places at Cierva Point between the most abundant pygoscelid species is related to their distinct breeding preferences (Jablonski 1986).

TABLE 3

Average annual growth rate (*i*) for Kelp Gulls, skuas and Gentoo penguins.
(*)Novatti (1978) data recorded at same date

Period	Kelp Gull (*i*%)	Skuas (*i*%)	Gentoo Penguin (*i*%)
1954–1956	–	–	–1.23
1956–1957	–	–	–2.84
1957–1958	–	–	–1.99
1954–1958	–	–	–2.31
1958–1991	–	–	1.08
1991–1992	–	–	11.25
1992–1993	–	–	13.37
1993–1994	–	–	1.58
1994–1995	–	–	–1.07
1993–1995	–	1.69	0.24
1995–1996	–	–	2.66
1957–1995	–0.86	1.78	1.47
1957(*)–1996	–	–	1.54

Adélie Penguin

A single pair breeding in a Gentoo Penguins subcolony was observed for two consecutive seasons in exactly the same place. Jablonski (1986) also mentioned the existence of single nests among Gentoo Penguin breeding groups. This pair went missing in the 1995/96 summer, though visitors of this species were frequently observed during the span of the study.

Southern Giant Petrel

Southern Giant Petrels were not observed during the four first seasons, and re-appeared in the summer of 1994/95, at the beginning of December, indicating the possibility of a colonization process. During the 1995/96 breeding season, one breeding pair was found in the area and they were frequently observed as an occasional species (Table 1). Novatti (1978) also reported frequent visits of non-breeding Southern Giant Petrels in February. These facts may reflect the impact of human activities on this species between 1954 and 1958.

During the 1997/98 breeding season, several nests with chicks were found on the Moss Islands, which are included within the SSSI (G. Mataloni pers. comm., Fig. 1.). Novatti (1978) observed Southern Giant Petrels preying upon Gentoo Penguin chicks and eggs, an event we have not witnessed.

Pintado Petrel

Like the Southern Giant Petrel, this species became more numerous during the last three seasons at Cierva Point. The population showed some growth from 1990/91 (Table 1). The presence of these breeders was attended by several flocks feeding at Cierva Cove (Fig. 1). The highest number of breeders was observed during the 1995/96 summer, with seven pairs breeding on the coast; additionally nine birds were found in a courtship attitude. Novatti (1978) reported 14 breeding pairs in 1954.

As was observed by Novatti (1978), Pintado Petrel nests were on somewhat vertical rocky walls of different heights next to the sea. Downes (1959) pointed out that Pintado Petrels bred on high cliffs, from the very bottom up to two hundred metres high. We observed that there was a great separation between nests and only two at five metres' distance were found.

Snow Petrel

Only one nest was found, during the 1995/96 summer (Table 1), located at the bottom of a cavity on a coastal stack. Novatti (1978) pointed out that in 1957 there were only two nests of the Snow Petrel. This contradicts the management plan which states the SSSI supports 'important colonies' of the species (Anon. 1998, see also Croxall *et al*. 1995). In the last two summers, a greater number of Snow Petrels have been seen as non-breeding visitors, similar to those found by Novatti (1978) in 1957 (Table 2). Remains of Snow Petrels apparently killed by skuas were found on Leopardo Island, suggesting this species may breed there.

White-chinned Petrels

Two White-chinned Petrels were seen foraging in Cierva Cove on 16 December 1995. According to Watson (1975) this petrel is not commonly seen south of the Antarctic Polar Front. This represents the first record of this species in this area, since there are no previous observations south of 64°S.

Wilson's Storm Petrel

During the 1994/95 breeding season, 1168 Wilson's Storm Petrel breeding sites were counted, representing only a small portion of the total population at Cierva Point. Lack of previous censuses preclude any estimation of temporal fluctuations. Compared to other Antarctic places (Beck & Brown 1972, Wasilewski 1986, Aguirre 1995), this petrel population seems to be large, with an estimate of 6500 to 7000 pairs.

Wilson's Storm Petrels bred both on exposed rock areas and, less frequently, on mossy ground. Whereas the spatial distribution of colonies on the coast was continuous, on exposed hillsides it was patchy, associated with moss. The firmness of the ground seems to affect nest site selection, given the avoidance of areas with loose pebbles.

This petrel does not seem to be affected by human presence. On the rocky wall, the highest density was recorded in an area strongly affected by anthropogenic effects (1 nests/2.5 m^2), but it was very much lower in other areas less affected by humans (1 nest/14.3 m^2). Similar observations have been reported from different Antarctic sites (Beck & Brown 1972, Wasilewski 1986, Orgeira & Recabarren 1993).

At Cierva Point, density was 1 nest/12.5 m^2 on rocky walls, and 1 nest/32 m^2 on exposed slopes. The contrast between both density values might be due to the fact that mossy cushions, as mentioned before, do not seem to be the optimum habitat for these birds. The comparison of different proportions of rocky and mossy surfaces showed that breeding sites were more abundant in rocky areas, regardless of the moss to rock proportion. For instance, in an area with 96% moss and 4% exposed rock, 68 nests were found in the rocky area and 24 in the mossy. A similar situation was reported by Beck & Brown (1972) for the moss patches of Signy Island. Roberts (1940) reported the opposite situation on Argentine Island, where he observed large Wilson's Storm Petrel colonies on moss patches. However, he reported that, unlike Cierva Point, these were the only available habitats present.

Imperial Cormorant

The colony of this species was found mingled with the Chinstrap Penguin colony on Pingüino Island, as also mentioned by Novatti (1978) for 1954. The colony consisted of 100 breeding pairs in 1991/92 and 33 pairs in 1993/94. On 1 February 1994, there were 33 chicks and 19 adults present, which might have been affected by human disturbance. The year after the birds were counted for the first time, a helicopter went over the area at low altitude. After this disturbance, the number of breeding pairs fell drastically. All Chinstrap Penguin nests in the affected area were abandoned after the incident. Anon. (1998) states that the Imperial Cormorant breeds within the SSSI, although Pingüino Island, the only reported breeding site in the vicinity, falls outside the site boundary (Fig. 1).

Greater Sheathbill

Only three to four breeding pairs were found between 1991 and 1996 (Table 1). Novatti (1978) recorded the similar numbers in the 1950s. The sites where he found some coastal nests matched those of the current study. Greater Sheathbills seem to be more abundant at other Antarctic locations. Aguirre (1995), for example, recorded 15 breeding pairs and more than 300 birds in October 1995 at Potter Cove and Stranger Point, South Shetland Islands. In contrast with Aguirre's (1995) observations, where Greater Sheathbill nests were closely associated with penguin breeding groups, at Cierva Point this species was found in cavities on coastal stacks, far away from the penguin colony and scavenging among seals, feeding on faeces.

Subantarctic and South Polar Skuas

We counted 176 breeding pairs in 1992/93 and 182 in 1994/95, only in the area systematically surveyed. The rest of the area showed a similar density of skua breeders, indicating that counted pairs represent only part of the whole skua population, estimated at about 450. At Pingüino Island, only three pairs were found in 1994/95 and two in 1995/96. The total population of both skua species showed a 1.7% average annual growth rate between 1993 (Table 3).

The South Polar Skua population seems to be bigger than the Subantarctic Skua one, a fact that would match data from other reports (Furness 1987, Young 1994). A total of 127 breeding pairs was identified specifically: 93 (73.2%) were South Polar Skuas, 26 (20.5%) Subantarctic Skuas and 8 (6.3%) mixed pairs. Many pairs were impossible to classify because of their complex morphological variability compared to the typical patterns of each skua species.

The large skua population at Cierva Point, implies that this is one of the most important breeding sites at this latitude. Several studies report smaller breeding groups (Pietz 1987, Favero *et al.* 1991). Croxall *et al.* (1984) estimated the number of breeding pairs as 150 Subantarctic Skuas and 650 South Polar Skuas on the Antarctic Peninsula.

Most of the skuas' breeding sites were located in the large 'turf-moss' association areas with dominance of *Polytrichum alpestre*: 75.4% of the total observed nests were on extensive moss patches. For example, in habitat-type 4 (20 500 m^2 of moss-turf area), an average of 29 skua nests was found (Table 1). Some skua nests, mainly of Subantarctic Skuas, were also found in small patches located on the edge of Gentoo Penguin nesting breeding areas. Some authors (Osborne 1985, Favero *et al.* 1991) have pointed out that the skua habitats include, or are closely adjacent to, colonies of most of their main prey species. However, only 16.6 % of the total sampled skua nests were in the penguin nesting area (Quintana & Travaini 2000).

We also found a few nests built on moss-carpets, lichen habitat-types and exposed-rock areas, where small pebbles were used to build the nest. This coincides with Osborne's (1985) observations on Bird Island, where Subantarctic Skuas were found in a diverse range of habitats, from open scree to deep tussock grass. On the other hand, Aguirre (1995) found skua nests on gravel terraces with abundant lichen growth.

Average density of skua nests was one nest/4074 m^2 (range one nest/820–91 036 m^2). The maximum skua nest density was observed in areas with dense moss cover; the minimum distance between nests ranged between 4 and 25 m. For example, in habitat-type 4 the average nest density was about one nest/707 m^2, which might be due to the fact that moss cushions are considerably drier and warmer than carpets, and so they provide obvious benefits during the incubation period. As a rule, the higher the difference between both average soil and air temperatures (range 9–12°C), the higher the nest density in these habitat-types.

Kelp Gull

Around 62–69 breeding pairs of Kelp Gulls (Table 1), grouped in three main patches, were found on small coastal cliffs, which were mainly covered by *Deschampsia antarctica* grass. A group of 6–10 nests was located on a small pebble beach (habitat-type 10) on isolated patches of *D. antarctica*. In a sector of the Cierva Point coast (habitat-type 9), the average number of gull nests found was 15 (Table 1). Like skuas, counted pairs do not account for the total population, since other colonies have been detected in practically inaccessible areas and consequently, they were not surveyed. However, its population might be smaller than the skua one. A small colony of this species was found on Pingüino Island, in which five chicks were observed on 1 February 1996. Novatti (1978) recorded 85 breeding pairs in 1954 and 82 in 1957.

Kelp Gulls showed a decreasing trend (–5.2%) for the 1993–1995 period, a trend also observed when our data was compared with those from Novatti (1978) for the 1954–1958 period (Table 3). Eggs and chicks were lost to the skua predation and adults were observed taken by skuas on two occasions. Jablonski (1986) showed that the low breeding success of gulls was due to predation by Greater Sheathbills. Low breeding success was also observed in colonies at 25 de Mayo/ King George Island, South Shetland Islands (P. Silva pers. comm.). In our case, very different reproductive success values (0.2 and 2 chicks/nest) were observed between two coastal areas with different conditions of accessibility. This, together with human disturbances and proximity to skua nest sites, could indicate that small changes in environmental conditions might drastically affect the fitness of the species.

The average density for gull nests was about 1 nest/5611 m^2 (1 nest/1438 m^2 for habitat-type 10 and 1 nest/7836 m^2 for habitat-type 9). Novatti (1978) recorded a gull nest density for habitat-type 10 of about 1 nest/920 m^2 in 1954.

Antarctic Tern

This species bred in small numbers (Table 1). During 1995/96 a colony of 50–60 adults and 20 nests was found *c*. 2 km east of the station (Table 1). Like Kelp Gulls, Antarctic Terns nested on coastal cliffs with patches of *D. antarctica*, with exception of the new colony, which was located on a pebble beach with a moss carpet cover.

Novatti (1978) recorded three colonies totalling 65–70 breeding pairs in 1954 and 85 pairs in 1957 (Table 1). The subsequent decrease in abundance could be related to the effects of human disturbance (Prevost 1958, Roby *et al*. 1986, Croxall 1987, Peter *et al.* 1991, Anon. 1993). Antarctic Terns may change breeding sites due to human pressure: in 1981 the colony at Gurruchaga Refuge, Nelson Island, disappeared, and was found again three years later 4 km north (R. Montiel pers. comm.). The unexpected appearance of the colony at Cierva Point during the last summer season could be due to a similar phenomenon.

Black-necked Swan

On 6 January 1996 a Black-necked Swan was seen feeding in the internal portion of Cierva Cove near Primavera Station on 6 January 1996. Black-necked Swans were observed at 14 different localities along the Antarctic Peninsula in 1989/90 (Orgeira & Fogliatto 1991).

CONCLUSIONS

The declaration of Cierva Point as a SSSI has reduced human disturbance, thought to have contributed to the slight increases in the richness and abundance of breeding bird species during the 1990s, although for several species numbers have not yet reached those recorded in the 1950s. Surveys of the unstudied islands within the SSSI (Fig. 1) are now needed to assess fully the protected bird populations in the vicinity of Cierva Point.

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